

## CLAIMS

**What is claimed is:**

1. A process for the crystallization of an adipic acid-containing oxidation product produced by the nitric acid oxidation of cyclohexanone (K) and cyclohexanol (A), said oxidation product comprising adipic acid, glutaric acid and nitric acid, said process comprising,

introducing into a first crystallizer said oxidation product, said crystallizer providing a first crystallization temperature sufficient to produce a first crystallizer product comprising a first mother liquor and a first harvest of solid crystals, said solid crystals being present at a concentration of at least about 10 weight percent based on the combined weight of the mother liquor and the crystals;

introducing the first crystallizer product into a second crystallizer providing a second crystallizer temperature lower than said first temperature to produce a second crystallizer product comprising a second mother liquor and a second harvest of solid crystals, said second mother liquor having a lower concentration of adipic acid than said first mother liquor and said second harvest of solid crystals having a greater weight percent of adipic acid than said first harvest; and

either

harvesting the solid crystals from the second crystallizer if the concentration of adipic acid in solution in the second mother liquor is less than or equal to a pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, or, if the concentration of adipic acid in solution in the second mother liquor is higher than said pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, then

introducing the second crystallizer product into one additional crystallizer or a plurality of additional crystallizers in series providing successively lower crystallization temperatures until a final crystallization product comprising a final mother liquor and a final harvest of solid crystals is produced in which the concentration of adipic acid in

solution in the final mother liquor is less than or equal to said pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the final mother liquor, and

5 harvesting the solid crystals from the final crystallization product.

2. The process of claim 1 further comprising

- (a) withdrawing at least a portion of the first crystallizer product from the first crystallizer,
- 10 (b) combining at least a portion of the adipic acid-containing oxidation product and the first crystallizer product from step (a) to produce a first premixed feed slurry, and
- (c) feeding the first premixed feed slurry to the first crystallizer.

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3. The process of claim 1 further comprising

- (a) withdrawing at least a portion of the second crystallizer product from the second crystallizer,
- (b) combining at least a portion of the adipic acid-containing oxidation product and the crystallizer product from step
- 20 (a) to produce a second premixed feed slurry, and
- (c) feeding the second premixed feed slurry to the second crystallizer.